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TWO NEW ANTS OF THE GENUS *SOLENOPSIS* (*DIPLORHOPTRUM*) FROM EASTERN TEXAS (HYMENOPTERA: FORMICIDAE)

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Abstract.—***Solenopsis subterranea*, n. sp.** and ***S. puncticeps*, n. sp.** are described from 10 K N of Kurten, Brazos Co., Texas, USA. *Solenopsis subterranea* also occurs in Louisiana. Both species are members of the subgenus *Diplorhoptrum* as it is presently defined. These two species have potential importance as natural enemies of founding queens of the imported fire ant, *Solenopsis invicta* Buren.

Key Words: Formicidae, red imported fire ant, *Solenopsis invicta* predation, biocontrol, *Diplorhoptrum*

Ants of *Solenopsis* (*Diplorhoptrum*) are difficult to identify as the workers are very small (often less that 2 mm long) and the species demonstrate considerable convergence in the worker caste (Creighton 1950). They are primarily hypogaeic or "geobionts" (Kempf 1961), and most species are seldom collected unless special techniques are used. Their nests are often found in close proximity to the nests of other ant species from which they presumably steal brood or food.

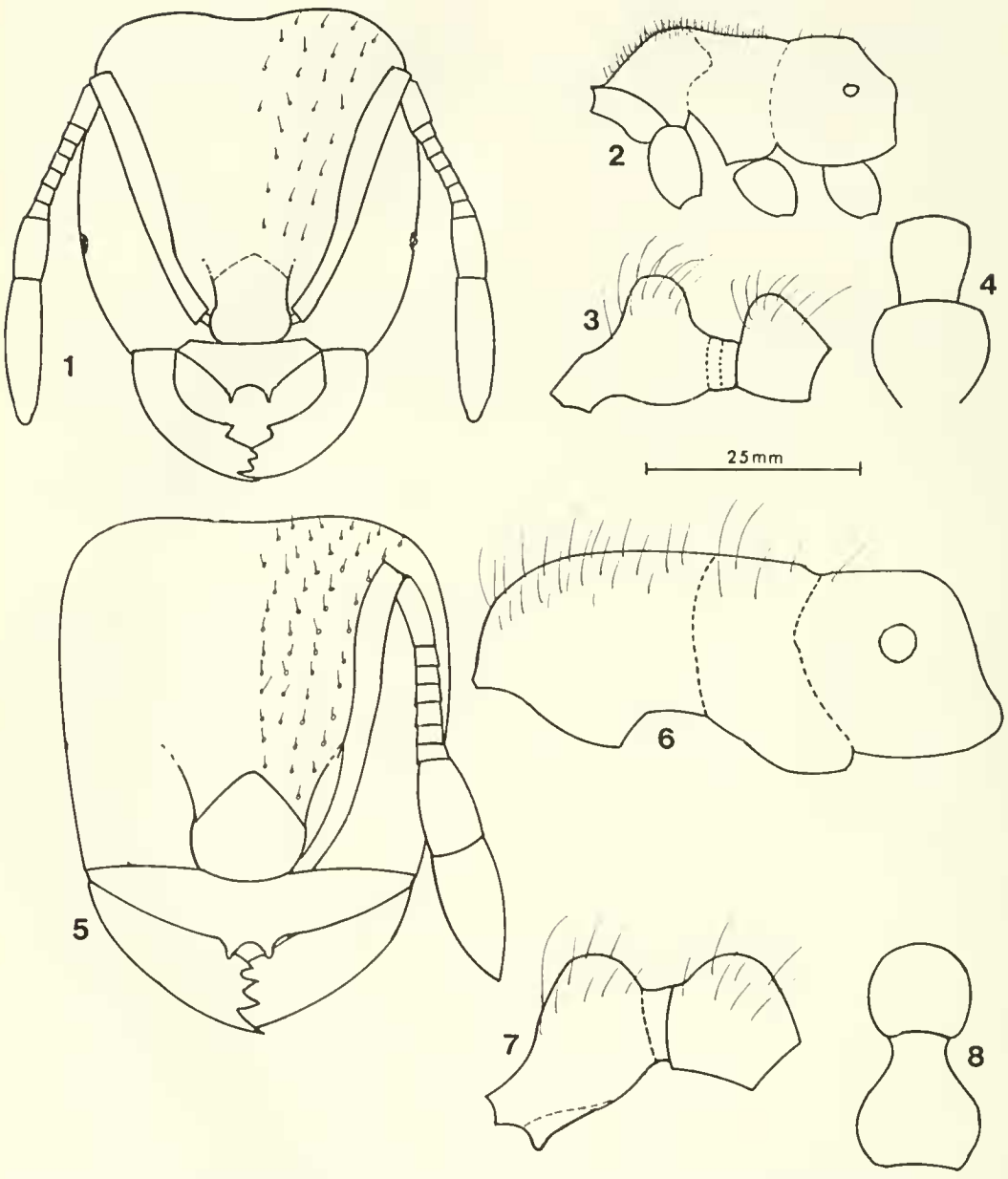
Ants of this subgenus are important as predators of founding queens of the imported fire ant, *Solenopsis invicta* Buren (Lammers 1987). There are undoubtedly many undescribed species in the subgenus, and it is in great need of revision. However, we are describing these two species at this time because of the need to place names on natural enemies which may be important in controlling populations of the imported fire ant.

Solenopsis (*Diplorhoptrum*) *subterranea* MacKay and Vinson, NEW SPECIES

Figs. 1–4

Description (worker).—Head length (HL—anterior median border of clypeus to median occipital margin) 0.34–0.38 mm; head width (HW—maximum, at eye level) 0.24–0.25 mm; maximum eye length (EL) 0.02–0.03 mm; scape length (SL—excluding basal condyle) 0.19–0.21 mm; Weber's length (WL—anterior pronotal declivity to metasternal lobe) 0.30–0.35 mm; maximum petiolar width (PW) 0.08–0.09 mm; maximum postpetiolar width (PPW) 0.09–0.10 mm; cephalic index (CI = HW × 100/HL) 67–74; ocular index (OI = EL × 100/HL) 6–7; scape index (SI = SL × 100/HL) 52–63. Mandible with 4 well defined teeth (Fig. 1), smooth and shining with scattered punctures; clypeus with 2 well developed carinae which end in long, well developed teeth on both sides of median lobe, area between carinae depressed, smooth, shining; dorsum of head smooth, polished, with numerous scattered coarse punctures which are much greater in diameter than the hairs which arise from them (Fig. 1); occiput somewhat concave in full face view; antennal scape smooth and shining with punctures which are much smaller in diameter than those on dorsum of head, with numerous erect and suberect hairs; eye small with a total of about 3 ommatidia.

Mesosoma smooth and shining, with



Figs. 1–4 Holotype of *S. subterranea*: 1. Full face view showing representative section of punctures; 2. Lateral view of mesosoma; 3. Lateral view of petiole and postpetiole; 4. Dorsal view of petiole and postpetiole.

Figs. 5–8. Holotype of *S. puncticeps*: 5. Full face view showing representative section of punctures; 6. Lateral view of mesosoma; 7. Lateral view of petiole and postpetiole; 8. Dorsal view of petiole and postpetiole. All illustrations are drawn to same scale.

scattered punctures not much greater in diameter than the hairs which arise from them (Fig. 2); petiole and postpetiole rounded (Fig. 3), width of postpetiole greater than that of petiole (Fig. 4); gaster smooth and shining with scattered punctures not much greater in diameter than hairs which arise from them.

Entire dorsa of head and mesosoma covered by short (0.01–0.04 mm), erect and suberect hairs (Fig. 2). Light yellowish-brown with gaster and legs slightly darker, tips of mandibular teeth and eyes dark brown or black.

Female and male: Unknown.

Etymology.—From Latin, subter—beneath, and terra—soil, as we have found this species only below the soil surface.

Type material.—Holotype and 20 paratypes to be deposited in the Museum of Comparative Zoology, Harvard University; additional paratypes (180) to be deposited in the United States National Museum, American Museum of Natural History, California Academy of Sciences, Los Angeles County Museum of Natural History, British Museum of Natural History, Museo de Historia Natural (México), the Field Museum of Natural History, the Florida State Collection of Arthropods, Universidade de São Paulo, Museo Argentino de Ciéncias Naturales, Universidad Nacional de Colombia, the Insect Collections of Texas A&M University and Mississippi State University, and the collection of WPM.

Distribution.—Known from the type locality, 10 K N Kurten, Brazos Co. TX (eastern Texas, on N side of Ferrill Creek Rd., 3.94 K E of turnoff from Farm Road 2038 North) and southwestern Louisiana. A single worker was captured in a subterranean trap baited with a mealworm in Louisiana (not designated as a paratype). It was collected in Calcasieu Parish, Sam Houston Jones State Park on 17 Aug. 1987, collection number 9724-1. We have sampled intensively throughout the southeastern region of the United States with subterranean baits and have not collected this species in any other locality.

Biology.—Captured in subterranean pitfall traps at 10 cm depth, baited with a cooked mixture of eggs, hamburger and honey, as well as a trap baited with live mealworms. We have not captured this species on the soil surface at the type locality, despite intensive searches of the area by five different individuals.

Solenopsis (*Diplorhoptrum*) *puncticeps* MacKay and Vinson, New Species

Figs. 5–8

Description (worker).—HL 0.50–0.51 mm; HW 0.48–0.49 mm; EL 0.04 mm; SL 0.35–0.36 mm; WL 0.59–0.61 mm; PW 0.14–0.15 mm; PPW 0.16–0.18 mm; CI 95; OI 7–8; SI 68–73. Mandible with 4 well defined teeth (Fig. 5), smooth and shining with scattered punctures; clypeus with 2 well defined teeth, depressed, smooth and shining between the teeth; dorsum of head smooth and shining, but with numerous large, coarse punctures (Fig. 5); occipital border slightly concave; scape smooth and shining with much smaller punctures than on the surface of head; mesosoma smooth and shining with a few scattered punctures; spiracle on propodeum very large and round in shape (Fig. 6); ventral peduncular tooth of petiole well developed, flattened and moderately pointed (Fig. 7); petiolar node not as wide as postpetiolar node (Fig. 8).

Entire body surface with erect hairs (Fig. 6): those on head short (0.02—0.05 mm) and subequal in length, those on dorsum of mesosoma longer (up to 0.8 mm) and uneven in length (Fig. 6), hairs on petiole, postpetiole and gaster similar to those on mesosoma. Color medium yellowish-brown with mandibular teeth and eyes somewhat darker.

Female and male: Unknown.

Etymology.—From Latin, puncta—puncture and ceps—derivation of caput for head.

Type material.—Holotype and 10 paratypes will be deposited in the Museum of Comparative Zoology, 110 paratypes will be distributed to the institutions mentioned previously.

Distribution.—Known only from the type locality, 10 K N Kurten, Brazos Co. TX (same type locality as *S. subterranea*).

Biology.—Captured in a subterranean trap

baited with the cooked mixture of eggs, hamburger and honey.

Discussion.—Both of these species are members of the group of thief ants in which the dorsum of the head is covered with coarse punctures which are much larger in diameter than the hairs which arise from them (couplets 10–13 of Creighton's 1950 key to species). *Solenopsis subterranea* is apparently most closely related to, and could be confused with *S. tennesseensis* Smith (*S. longiceps* in Creighton's key). It differs in that the postpetiole is not circular as seen from above, and the head and mesosoma are covered by short erect and suberect hairs (0.01–0.04 mm long and essentially equal in length in *S. subterranea*, uneven in length with a range of 0.04–0.08 mm in *S. tennesseensis*). *Solenopsis tennesseensis* is somewhat larger (HL 0.41, HW 0.30, WL 0.44), but the CI(73), OI(7) and SI(59) are within the range of *S. subterranea*. This new species differs from *S. krockowi* Wheeler as it is much smaller (*S. krockowi*: HL 0.51–0.54, WL 0.53–0.57), and has much smaller eyes (diameter in *S. krockowi* = 0.05, OI 9–10). The clypeal teeth are very small in *S. krockowi* and the erect hairs on the head and mesosoma of *S. krockowi* are uneven in length and range from 0.03–0.13 mm. It differs from *S. salina* Wheeler in that the tooth on the anterior peduncle of the petiole of the new species is blunt and compressed (it is usually sharply pointed in *S. salina*). Hairs on the body surface are longer in *S. salina* (0.04–0.08 mm) and are greatly unequal in length.

Solenopsis puncticeps is distinctive in that the punctures on the dorsum of the head are very large and coarse. It could be confused with the closely related *S. pergandei* Forel which has similar punctures, but the postpetiole from above is not round in shape, as it is in *S. pergandei*. It can be distinguished from *S. krockowi* by the coarser punctures on the dorsum of the head, and the diameter of the propodeal spiracle which is about twice that of the spiracle of *S. krockowi*. It is easily separated from *S. subterranea* by the hairs on the propodeum which are much longer and unequal in length.

We suspect these species are important natural enemies of the founding queens of the imported fire ant, as are others in the subgenus *Diplorhoptrum* (Lammers, 1987). The fire ant density at the type locality of the two new species is much lower than in the surrounding area, possibly due in part to the presence of these species as well as an abundance of other species of the same subgenus.

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